

etching said semiconductor substrate to form a first groove by using said first film as a mask;

forming a second film in said first groove and thereafter removing said first film;

diffusing an impurity on a surface of said semiconductor substrate to form an impurity diffusion region including a part thereof extending below the first groove by using said second film as a mask;

forming an insulator film on said impurity diffusion region and thereafter removing said second film to form a second groove in the semiconductor substrate;

forming a gate insulator film in said second groove so that a top surface of said gate insulator film is higher than a top surface of said impurity diffusion region; and

forming a gate electrode on the top surface of said gate insulator film.

18. (Twice Amended) A method for producing a MIS transistor comprising a semiconductor substrate, source/drain regions formed on the semiconductor substrate, and a gate electrode provided above a channel region between the source/drain regions, said method comprising:

selectively forming a first film on said semiconductor substrate;

etching said semiconductor substrate to form a first groove by using said first film as a mask;

forming a second film in said first groove and thereafter removing said first film;

diffusing an impurity on a surface of said semiconductor substrate to form an impurity diffusion region including a part thereof extending below the first groove by using said second film as a mask;

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

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forming an insulator film on said impurity diffusion region and thereafter removing said second film to form a second groove in the semiconductor substrate;

forming a gate insulator film in said second groove and on said insulator film;

polishing said gate insulator film by using said insulator film as a stopper so that a top surface of said gate insulator film is higher than a top surface of said impurity diffusion region; and

forming a gate electrode on the top surface of said gate insulator film.

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22. (Twice Amended) A method for producing a MIS transistor comprising a semiconductor substrate, source/drain regions formed on the substrate, and a gate electrode provided above a channel region between the source/drain regions, said method comprising:

selectively forming a first film on said semiconductor substrate;

diffusing an impurity on a surface of said semiconductor substrate to form an impurity diffusion region including an elevated impurity diffusion region from a channel region by using said first film as a mask;

forming an insulator film on said impurity diffusion region;

removing said first film so as to form a groove in the semiconductor substrate;

forming a gate insulator in said groove in the semiconductor substrate so that a top surface of said gate insulator film is higher than a top surface of said impurity diffusion region; and

forming a gate electrode on a top surface of said gate insulator film.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

27. (Twice Amended) A method for producing a MIS transistor comprising a semiconductor substrate, source/drain regions formed on the substrate, and a gate electrode provided above a channel region between the source/drain regions, said method comprising:

selectively forming a first film on said semiconductor substrate;

diffusing an impurity on a surface of said semiconductor substrate to form an impurity diffusion region including an elevated impurity diffusion region from a channel region by using said first film as a mask;

forming an insulator film on said impurity diffusion region;

removing said first film so as to form a groove in the semiconductor substrate;

forming a gate insulator in said groove in the semiconductor substrate and on said insulator film;

polishing said gate insulator film by using said insulator film as a stopper so that a top surface of said gate insulator film is higher than a top surface of said grooved impurity diffusion region; and

forming a gate electrode on a top surface of said gate insulator film.

REMARKS

By this Amendment, Applicants amend claims 14, 18, 22, and 27 to more clearly recite the features of the present invention. For example, claims 14, 18, 22, and 27 have been amended to include the recitation "groove in the semiconductor substrate," which is clearly supported by Applicants' original disclosure, for example, Fig. 3D. Applicants submit that no new matter has been introduced. Thus, by entry of this Amendment, claims 14-33 are currently pending.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com